There were 214 endovascular interventions (71%) for endoleak and disease progression. 89 open interventions were required (29%). Almost half of open interventions were for limb ischaemia or groin complications. Open conversion was required for the majority of ruptures (n = 8/10) and continued sac expansion without endoleak (n = 33). The mortality associated with open conversion was 10%.

This series represents one of the largest in the literature and has a re-intervention rate of 19%, in line with previous reports. Although re-intervention is common, most complications can be successfully treated with endovascular techniques. However, if open abdominal intervention is required, there is a high mortality and the authors therefore propose a 'stent conserving' approach to open intervention.

Repair of Thoraco-abdominal and Peri-renal Aneurysms with the Multi-layer Flow-modulating Stent: The UK Pilot Study

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The multi-layer flow modulating stent (MFMS) is a novel approach for the treatment of complex aortic aneurysms. We report outcomes in a UK pilot study of treatment of aortic arch, thoraco-abdominal (TAAA) and perirenal aneurysms (PAA).

With MHRA Devices Agency and ethical approval, patients who were unfit for open surgery and had no option for complex endovascular repair were recruited. Follow-up included CTA at one, three, six and 12 months, then annually for three years. Outcome measures included 30 day mortality, rupture, branch vessel patency, complications, re-intervention and maximal aortic diameter.

Fourteen patients (6 PAA, 6 TAAA, 2 arch) were treated between October 2011 and March 2014; mean follow up is 19.4 months. Seven patients (50%) have died including one fatal rupture. 30 day mortality was 7.14%. 12 month survival was 78.6%. In those alive at 12 months, four remained stable while aneurysm size had increased by >5 mm in seven. To date, three of the seven surviving patients have remained stable on the most recent available imaging. 50 of 51 covered aortic branches remained patent with no embolic stroke or visceral ischaemia. Six re-interventions were performed in five patients (35%). There was one post re-intervention death.

The early MFMS devices have had little influence on the natural history of complex aortic aneurysms. Side branch patency was maintained but these MFMS frequently dislocated. Further development is needed if this novel technology is to have a role in treating aortic aneurysm.

Preoperative Morphological Factors of Thoracic Aortic Aneurysm Sac Enlargement after Endovascular Repair

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The effect of thoracic endovascular aortic repair (TEVR) on the aneurysm sac remains undefined. The aim of this study was to characterize the incidence of aneurysm sac expansion rate after TEVR and the effect of aortic morphology on sac behaviour.

A database of patients with pre and post-operative computed tomography angiogram (CTA) was provided by M2S, Inc. (2004 to 2013). All patients underwent TEVR for thoracic aortic aneurysms. Preoperative aortic anatomy including diameters, lengths and angulations were available for each patient. Post-TEVR sac expansion was defined as a >5 mm increase between the pre-operative and follow up CTA. The influence of pertinent aortic morphology on sac expansion was assessed using Kaplan-Meier analysis.

Of 899 patients undergoing TEVR, 46% had a maximum aneurysm diameter above the 55-mm threshold. The 5-year freedom from sac expansion was 61%. Several preoperative morphological factors were found to be associated with significant sac expansion after TEVR. The length of the proximal sealing zone <20 mm ($p = 0.020$), distal sealing zone <30 mm ($p = 0.008$), proximal and distal neck diameters over 38 mm (both, $p < 0.001$), distal aortic arch angle <60° ($p = 0.049$) and a maximal preoperative sac diameter >50 mm ($p = 0.003$) were more likely to be associated with sac expansion after 5 years.

This observational study demonstrated that post-TEVR aneurysm sac expansion is higher than expected, and this appears to be significantly influenced by several preoperative morphological factors. Meticulous preoperative patient selection and procedural planning is required to ensure favourable long-term results.